

TIMBER SALE MAP

SALE NAME: BETTY BEAVER

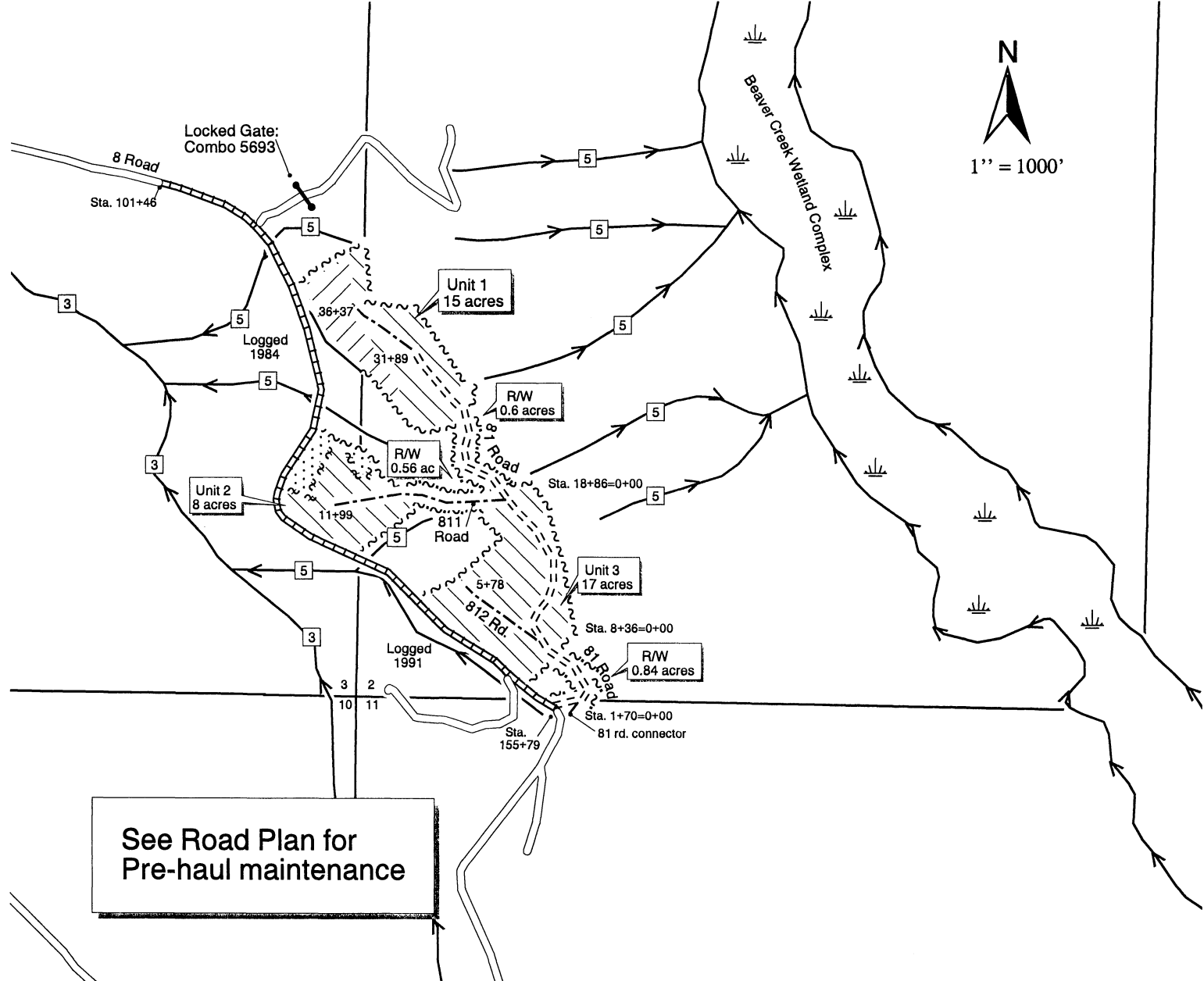
AGREEMENT NO: 30-075787

TRUST(S): FOREST BOARD TRANSFER & COMMON SCHOOL

REGION: SOUTH PUGET SOUND

COUNTY(S): PIERCE

ROAD PLAN PROJECT MAP  
TOWNSHIP 15 NORTH RANGE 05 EAST W.M.



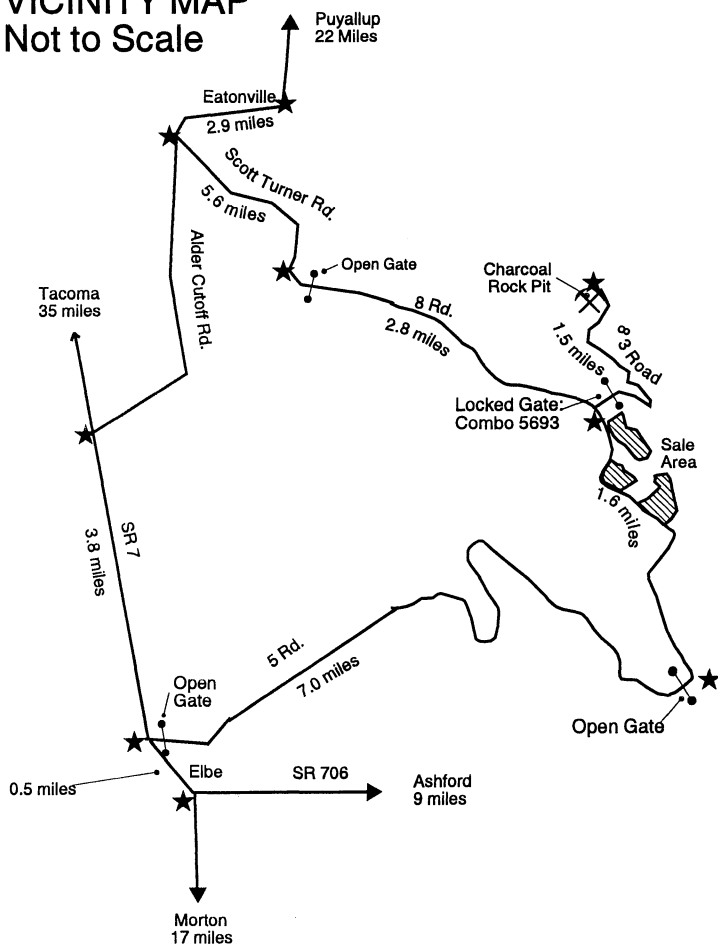
LEGEND

- ~~~~~ White Timber Sale Boundary Tags
- ~~~~~ Orange Right of Way Boundary Tags
- ~~~~~ Yellow Leave Tree Area Tags
- Cable
- Ground Based
- Leave Tree Area
- Existing Road
- Required Construction
- Optional Construction
- Pre-haul maintenance
- Stream
- Water Type
- Wetland

Elevation Range: 2,000-3,000 feet

Drawn By: A. Stuart  
Date: February 17, 2004

VICINITY MAP  
Not to Scale



STATE OF WASHINGTON  
DEPARTMENT OF NATURAL RESOURCES  
SOUTH PUGET SOUND REGION

BETTY BEAVER

ROAD PLAN

SECTIONS 2,3 and 11, TOWNSHIP 15 NORTH, RANGE 5 EAST, W.M.  
PIERCE COUNTY

RAINIER DISTRICT

AGREEMENT NO.: 30-075787

STAFF ENGINEER: M. Bell

DATE: 1/29/2004

DRAWN & COMPILED BY: M. Bell

SECTION 0 - SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

- clearing;
- grubbing;
- right-of-way debris disposal;
- excavation and/or embankment to subgrade;
- landing construction;
- acquisition and installation of drainage structures;
- acquisition, manufacture, and application of rock;
- road abandonment.

This project also includes but is not limited to pre-haul maintenance including:

- grading and shaping existing road surface and turnouts;
- acquisition, manufacture, and application of rock;
- rock stockpile manufacture.

SECTION 1 - GENERAL CLAUSES

1.1-1 ROAD PLAN SCOPE

Clauses in this plan apply to all construction or pre-haul maintenance including landings unless otherwise noted.

1.1-2 REQUIRED ROADS

Construction or pre-haul maintenance of the following roads is required. All roads shall be constructed or pre-haul maintained on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
8	101+46 to 155+79	Pre-haul Maintenance
81	0+00 to 31+89	Construction

1.1-3 OPTIONAL ROADS

Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
81	31+89 to 36+37	Construction
81 Connector	0+00 to 0+60	Construction
811	0+00 to 11+99	Construction
812	0+00 to 5+78	Construction

#### **1.1-4 ROAD PLAN CHANGES**

*Any departure from this Road Plan including relocation, extension, change in design or additional roads shall be submitted in writing, to the Contract Administrator for consideration, submitted plans must be approved before construction begins.*

#### **1.1-5 HIDDEN CONDITIONS**

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

#### **1.2-1 CONSTRUCTION PERIOD**

The construction, pre-haul maintenance or rock haul on any of the roads specified herein shall not be permitted when in the opinion of the Contract Administrator, excessive damage may occur, nor shall it be permitted from September 30 to May 15 unless authority to do so is granted, in writing, by the Contract Administrator.

#### **1.2-1C DAILY CONSTRUCTION TIME**

No operation of road construction equipment will be allowed on weekends or State recognized holidays unless authority to do so is granted in writing by the Contract Administrator.

#### **1.2-2 HAUL APPROVAL**

Purchaser shall not use roads constructed or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

#### **1.2-3 EXCAVATOR CONSTRUCTION**

Roads shall be constructed using track mounted hydraulic excavators unless otherwise authorized, in writing, by the Contract Administrator.

#### **1.2.1-1 CONSTRUCTION STEPS**

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator. Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the right of way limits, or restrict drainage.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, culvert installations, and subgrade compaction shall be completed and are subject to written approval by the Contract Administrator prior to rock application and/or timber haul.

#### **1.3-1A CLOSURE TO PREVENT ROAD DAMAGE**

At any time of the year, the hauling of forest products shall not be permitted when in the opinion of the Contract Administrator excessive road damage may occur.

#### **1.4-3 R P DAMAGE**

Blue reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said blue R.P.'s until all moved or damaged blue R.P.'s are reset.

#### **1.5-1 ROAD MAINTENANCE RESPONSIBILITY**

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

#### **1.5-3 SNOWPLOWING**

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

## **SECTION 2 - CLEARING**

#### **2.1-1 CLEARING SPECIFICATION**

Fell all vegetative material larger than 6 inches DBH or over 20 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1 GRUBBING SPECIFICATIONS

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2 GRUBBING LIMITS

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1 DEBRIS DEFINITION

Right-of-way debris is defined as all non-merchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2 DISPOSAL COMPLETION

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-3 DEBRIS PLACEMENT

Right-of-way debris shall not be placed against standing timber.

4.2.3-4 SCATTERING RIGHT OF WAY DEBRIS

Right-of-way debris shall be scattered outside the grubbing limits.

SECTION 5 - EXCAVATION

5.1-1 DEFAULT ROAD DIMENSIONS

Unless controlled by specific design sheets herein, roads shall be constructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3 ROAD GRADE AND ALIGNMENT

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse or as specified on drawings. Minimum radius curve is 60 feet.

5.1-4 CURVE WIDENING

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

Curve widening, where required, shall be added to the inside of curves.

5.1-7 CONSTRUCTION TOLERANCES

Roads shall be constructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8 CUT SLOPE RATIO

Excavation (cut) slopes shall be constructed no steeper than shown on the following table except as designed:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>	<u>Percent</u>
Common Earth (on side slopes less than 55%).....	1:1	100
Common Earth (55% to 70% sideslopes) .....	¾:1	133
Common Earth (on slopes over 70%) .....	½:1	200
Fractured or loose rock.....	½:1	200
Hardpan or solid rock.....	¼:1	400

**5.1-9 SHAPING CUT SLOPE**  
Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

**5.1-10 FILL WIDENING**  
Except as designed, embankments shall be widened as follows:

<u>Height at Shoulder</u>	<u>Subgrade Widening</u>
Less than 6 feet	2 feet
6 feet or over	4 feet

**5.1-11 FILL SLOPE RATIO**  
Embankment (fill) slopes shall be constructed no steeper than shown on the following table except as designed:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>	<u>Percent</u>
Common Earth and Rounded Gravel .....	1 ½:1	67
Angular Rock .....	1 ¼:1	80
Sandy Soils . ....	2:1	50

**5.1-12 DISPOSAL OF ORGANIC DEBRIS**  
Organic material shall be excluded from embankment.

**5.1-22 PROHIBITED DISPOSAL AREAS**  
Waste material shall not be deposited within 100 feet of a culvert installation, live stream, Riparian Management Zone, wetland or Wetland Management Zone.

**5.1-23 TURNOUTS**  
Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances. Location shall be subject to written approval of the Contract Administrator.

**5.3-1 FILL COMPACTION**  
All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

**5.5-4 SUBGRADE COMPACTION**  
Constructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 20,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

**5.5-5 SUBGRADE CROWN**  
Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

**6.2.1-1 CULVERT MATERIAL SPECIFICATION**  
Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294-S) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

**6.2.1-2 CULVERT BANDS**  
Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

**6.2.1-5 REQUIRED CULVERTS STATE PROPERTY**  
On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

6.2.2.1-1 CULVERT SPECIFICATIONS

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures".

6.2.2.3-1 CROSS DRAIN SKEW

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except for cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2 CULVERT SLOPE

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1 ENERGY DISSIPATORS

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1 DITCH CONSTRUCTION

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2 DITCH, HEADWALL, AND CATCHBASIN CONSTRUCTION

Shaping the ditchline, culvert headwalls, and catch basins shall be completed prior to application of rock and/or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.4-1 CATCH BASINS

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1 HEADWALLS

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1 ROCK SOURCES

Rock for construction or pre-haul maintenance under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State and subject to written approval by the Contract Administrator. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

<u>Source</u>	<u>Location</u>	<u>Type</u>
Charcoal Pit	SE ¼ NW ¼ Section 35, Township16 North Range 5 East, W.M.	4 Inch In Place 2 ½ Inch Minus Crushed

7.1-3 PIT OPERATIONS

All rock source operations shall be conducted as directed by the Contract Administrator.

7.2.1-4 ROCK QUALITY

"2 ½ INCH MINUS CRUSHED" rock shall meet the following specifications for gradation and quality when placed in hauling vehicles. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

7.2.1.1-5

**2½ INCH MINUS CRUSHED ROCK**

% passing 2½" square sieve.....	100%
% passing 2" square sieve.....	65 -100%
% passing 1" square sieve.....	50 - 70%
% passing ¾" square sieve.....	30 - 50%
% passing U.S. #40 sieve.....	16% Max
% passing U.S. #200 sieve.....	5% Max

All percentages are by weight.

The portion of ballast retained on ¼ inch sieve shall not contain more than 0.1 percent vegetative debris or trash.

7.2.1.1-8 **4-INCH IN PLACE**

"4 INCH IN PLACE" rock shall have a minimum of 90 percent of the top 4 inches of the running surface pass a 4-inch square opening. In place processing such as grid rolling, jaw crushing, or such other method as is demonstrated by the Purchaser to be effective, shall be required if necessary to achieve this requirement.

7.2.1.2-2 **DEBRIS IN ROCK**

Manufactured run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.2-1 **ROCK TESTING**

Rock crushing operations shall conform to the following specifications:

- The Purchaser shall provide a weatherproof field laboratory equipped with gradation testing equipment. This laboratory shall be available for use by the Contract Administrator during the entire crushing operation.
- The crushing operation shall be concluded within 60 working days from the time it begins.
- If a smooth roll crusher is used, the maximum size of material fed into it shall be equal to the largest size of the material coming out of it plus 8.5 percent of the roll radius.

7.2.3-3 **CRUSHED ROCK MEASUREMENT**

Measurement of the "2 ½ INCH MINUS CRUSHED" rock shall be accomplished with either certified belt scales or certified platform scales provided by the Purchaser.

7.2.3-3a **BELT SCALES**

Belt scales shall meet the following specifications:

- The belt conveyor scale shall meet the design, marking, installation, and tolerance requirements of the National Bureau of Standards Handbook No. 44 and shall be so certified by a copy of a National Bureau of Standards Prototype Examination Report of Test.
- The weighing mechanism shall contain a weight totalizer and ticket imprinter. A ticket for each truck shall be made and delivered to the Contract Administrator at the point of use. The totalizer calibration adjustment and ticket imprinter shall be furnished with a hasp to accept a State padlock.
- Under observation of the Contract Administrator, the purchaser shall run a daily zero load test in accordance with National Bureau of Standards Handbook No. 44.

7.2.3-3b **CERTIFIED PLATFORM SCALES**

Certified platform scales shall meet the following specifications:

- The scales shall have an enclosed weatherproof room around the reading device.
- The weighing mechanism shall contain a weight totalizer and ticket imprinter. A ticket for each truck shall be made and delivered to the Contact Administrator.
- The totalizer calibration adjustment and ticket imprinter shall be furnished with a hasp to accept a State padlock.

7.2.3-4 **WEIGHT-CUBIC YARD CONVERSION**

At the commencement of operations, a weight per cubic yard shall be calculated as follows:

- a. The box of each truck to be used for rock haul shall be measured.
- b. A load of rock shall be flattened off in each truck and its exact volume in cubic yards calculated.
- c. The net weight of each of these calibrating loads shall be divided by the volume calculated in step b.

Conversion factors thus calculated shall be valid for no more than 30 days or until rock density or moisture changes significantly, as determined by the Contract Administrator.

7.2.4-1 **DRILLING AND SHOOTING SPECIFICATION**

Rock drilling and shooting shall meet the following specifications:

- a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale.
- b. Oversize material is defined as rock fragments larger than two feet in any dimension.
- c. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 5 working days prior to any drilling.

7.3-1 **STOCKPILE CONSTRUCTION**

Rock stockpiles shall meet the following specifications:

- 1. The Purchaser shall stockpile an additional 5000 yards of “2 ½ Inch Minus Crushed” rock. This additional rock shall be stockpiled at the Charcoal Rock Pit.
- 2. Before placing aggregates upon the stockpile site, the site shall be cleared of vegetation, trees, stumps, brush, rocks, or other debris and the ground leveled to a smooth, firm, uniform surface.

The piles, when completed, shall be neat and regular in shape. The stockpile height shall be limited to a maximum of 24 feet. Stockpiles in excess of 200 cubic yards shall be built up in layers not more than 4 feet in depth. Stockpile layers shall be constructed by trucks, "clamshells" or other methods approved, in writing, by the Contract Administrator. Pushing aggregates into piles with a bulldozer shall not be permitted. Each layer shall be completed over the entire area of the pile before depositing aggregates in the next layer. The aggregate shall not be dumped so that any part of it runs down and over the lower layers in the stockpile. The method of dropping from a bucket or spout in one location so as to form a cone shaped pile will not be permitted.

No equipment other than pneumatic tired equipment shall be used on stockpiles. Stockpiles of different types or sizes of aggregate shall be spaced far enough apart, or separated by suitable walls or partitions, to prevent the mixing of the aggregates.

When removing materials from the face of the stockpile, the equipment shall be operated in such a manner as to face-load from the floor to the top of the stockpile.

7.4.2-1 **MINIMUM ROCK**

Apply at least the minimum required rock quantity as shown on ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-2 **SUBGRADE APPROVAL FOR ROCK**

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-3 **SUBGRADE SHAPING**

On the following road, a grader shall be used to shape the subgrade prior to the application of rock.

<u>Road</u>	<u>Stations</u>
81	0+00 to 31+89



7.4.2-3B **GRADING**

On the following road, a grader shall be used to shape the existing surface.

<u>Road</u>	<u>Stations</u>
8	101+46 to 155+79

7.4.2-7 **ROCK FOR WIDENING**

Turnouts and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8 **ROCK SHAPING**

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-2 **ROCK COMPACTION**

Rock shall be spread and compacted full width in lifts each not to exceed 12 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 20,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

**SECTION 9 - ROAD AND LANDING DEACTIVATION**

9.2-1 **LANDING DEBRIS**

Purchaser shall reduce or relocate debris generated by road and landing construction, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2 **LANDING DRAINAGE**

Purchaser shall provide for drainage of the landing surface as approved by the Contract Administrator.

**SECTION 10 - ROAD AND LANDING ABANDONMENT**

10.1-1 **ABANDONMENT**

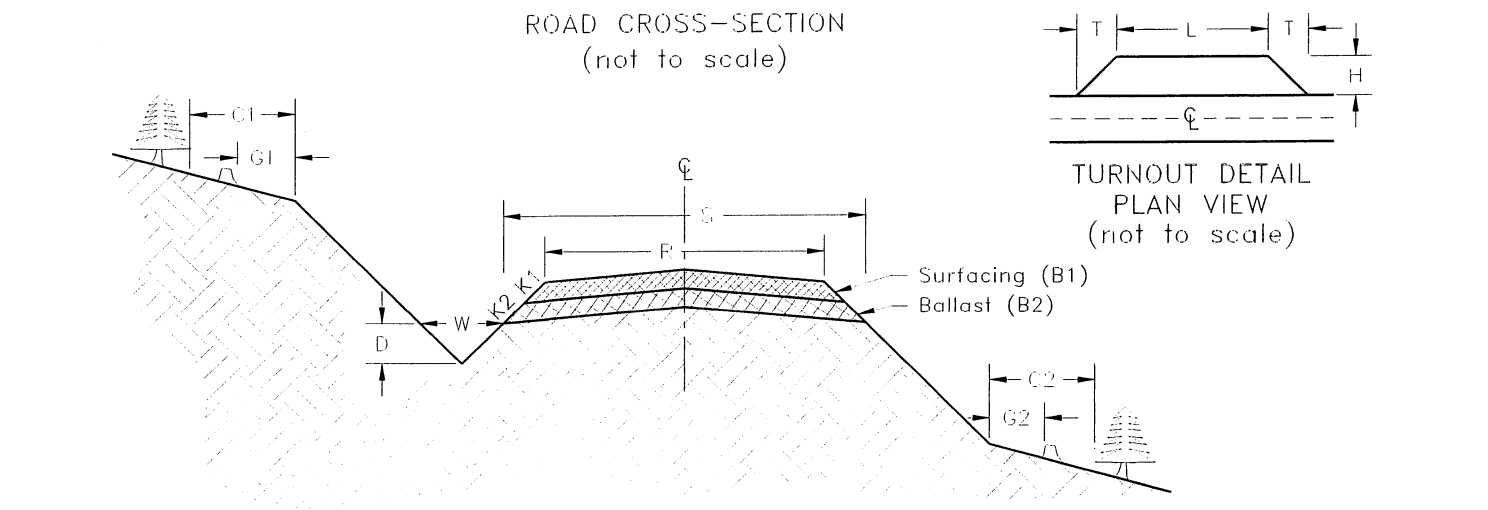
If constructed, the following roads shall be abandoned by the Purchaser within 30 days following completion of timber removal.

<u>Road</u>	<u>Stations</u>
81	31+89 to 36+37
811	7+40 to 11+99

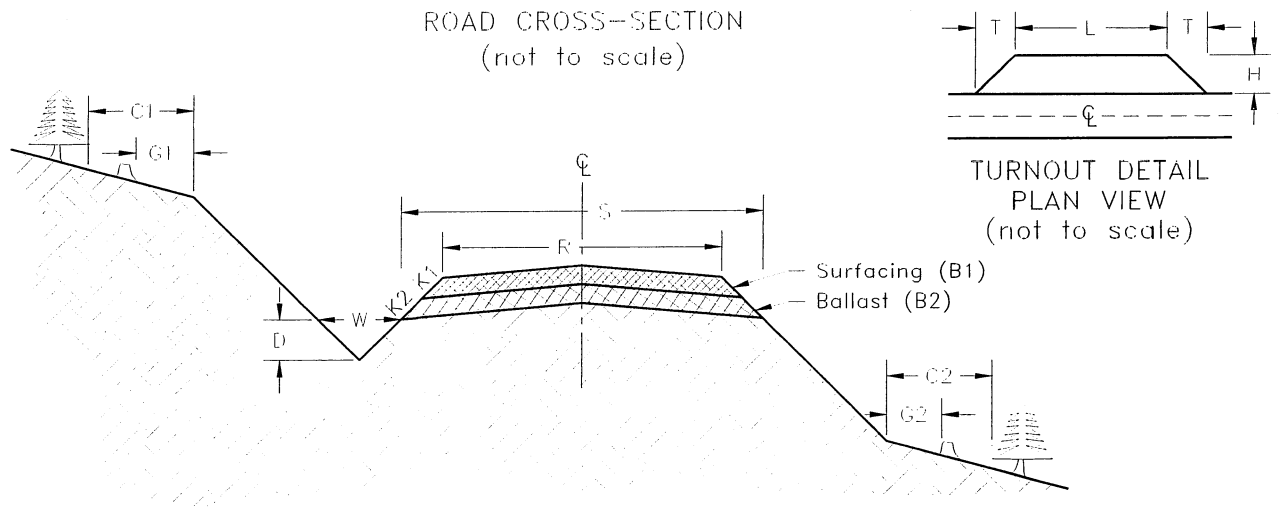
Abandonment shall consist of:

- Construction of tank trap barriers in conformance with the attached SINGLE TANK TRAP DETAIL;
- Constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet;
- Skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
- Keying water bars into ditchline;
- Removing ditch cross drain culverts and leaving the resulting trench open;
- Sloping all trench walls and approach embankments no steeper than 1.5:1;
- Removing culverts from State Land;
- Scattering right of way debris over the road prism;
- All work shall be completed as directed by the Contract Administrator.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade	Road	Ditch		Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
				Width (feet)	Width (feet)	Width (feet)	Depth (feet)		G1	G2	C1	C2	%	%
				S	R	W	D							
8	101+46	155+79	C		12	2	1							
81	0+00	6+70	C	15	12	2	1	4"	2	2	tags	tags	100	67
81	6+70	19+70	C	15	12	2	1	4"	2	2	5	5	100	67
81	19+70	25+45	C	15	12	2	1	4"	2	2	tags	tags	100	67
81	25+45	31+89	C	15	12	2	1	4"	2	2	5	5	100	67
81	31+89	36+37	C	13	10	2	1	4"	0	0	0	0	100	67
81 Connector	0+00	0+60	C	15	12	2	1	4"	2	2	tags	tags	100	67
811	0+00	2+50	C	13	10	2	1	4"	2	2	5	5	100	67
811	2+50	7+40	C	13	10	2	1	4"	2	2	tags	tags	100	67
811	7+40	11+99	C	13	10	2	1	4"	0	0	0	0	100	67
812	0+00	5+78	C	13	10	2	1	4"	2	2	5	5	100	67



ROCK LIST

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2	4-Inch In Place				L	H	T
81	0+00	31+89	1.5:1	12”	50	32	1600	Charcoal Pit	50	10	25
81*	31+89	36+37	1.5:1	9”	23	4.5	104	Charcoal Pit			
81 Connector	0+00	0+60	1.5:1	12”	50	0.6	30	Charcoal Pit			
811	0+00	7+40	1.5:1	9”	23	7.4	170	Charcoal Pit			
811*	7+40	11+99	1.5:1	9”	23	4.6	106	Charcoal Pit			
812	0+00	5+78	1.5:1	9”	23	6	138	Charcoal Pit			

BALLAST TOTAL 2148 Cubic Yards

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1	2 ½ Inch Minus Crushed			
8	101+46	155+79	2:1	9"	37	54	1998	Charcoal Pit

SURFACE TOTAL 1998 Cubic Yards

\*Optional Rock: If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required.

NOTE: Ballast and Surfacing yardages are estimated on a compacted (In-Place) basis. Compliance of required rock will be based on compacted depth measurement.

STOCKPILE

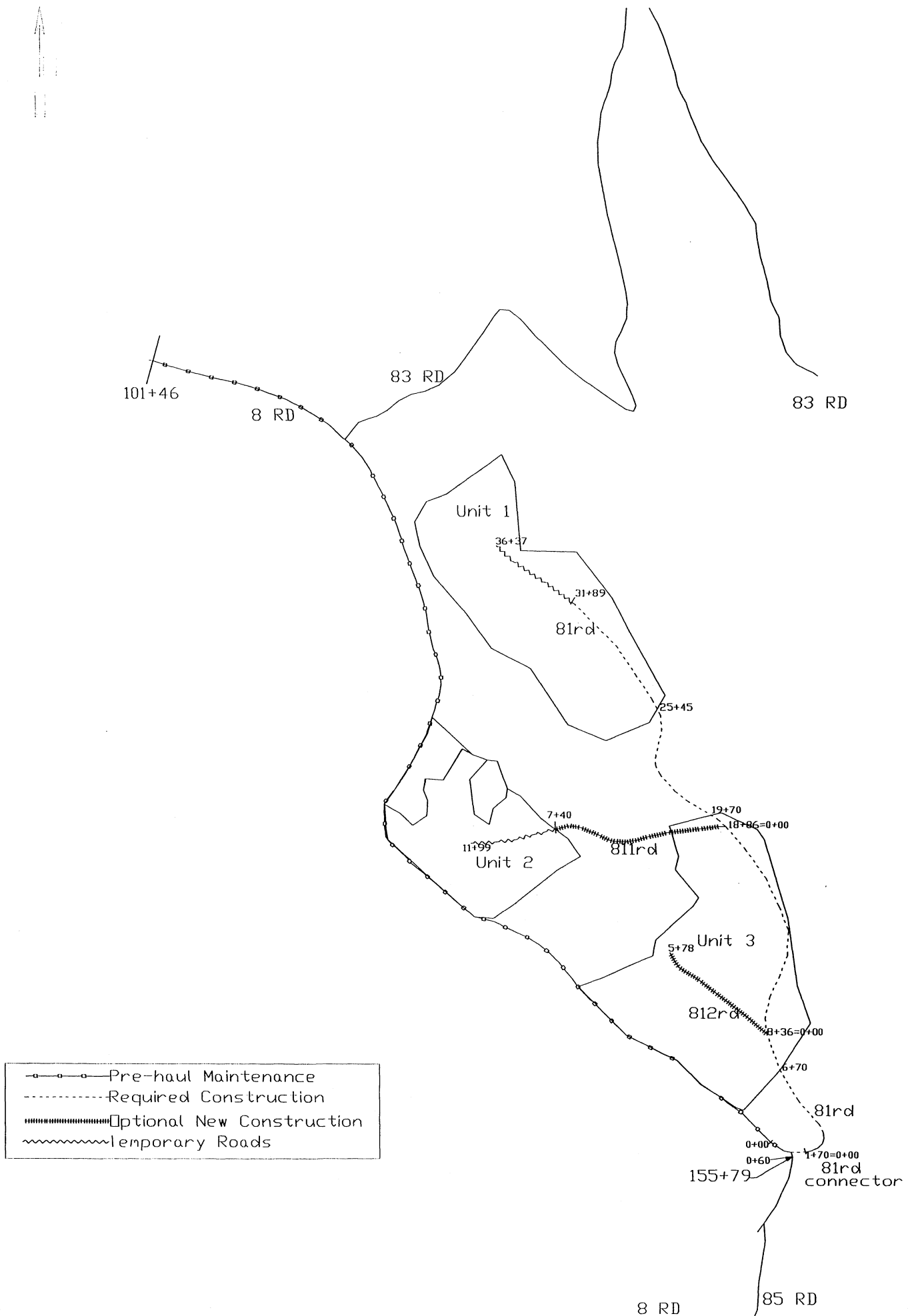
Location	Quantity	Specification	Comments
Charcoal Pit	5000 cy	2 1/2 INCH MINUS CRUSHED	Measurement as per clauses 7.2.3-3 and 7.2.3-4

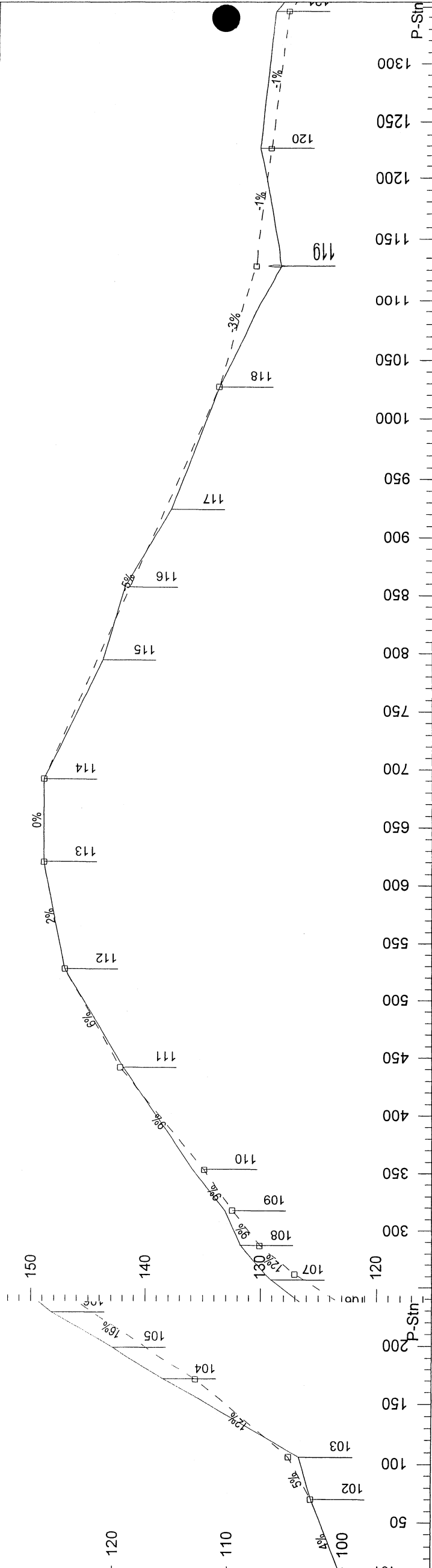
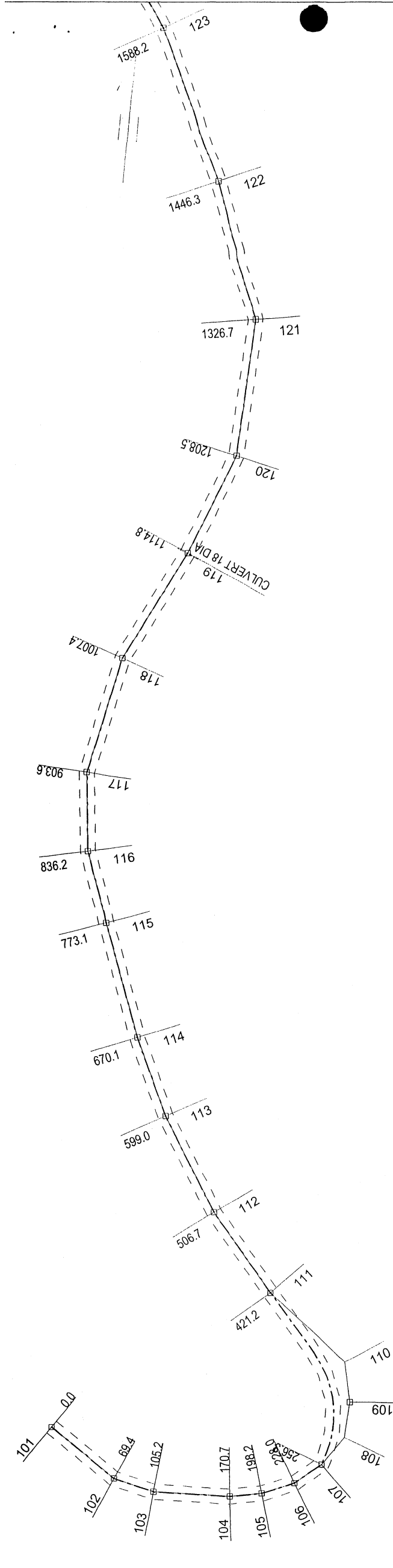
STOCKPILE TOTAL 5000 Cubic Yards

# BETTY BEAVER TBS

## Roads Plan View

no scale





Engineer: M. Bell

04/03/02

Plan Scale 1:1200

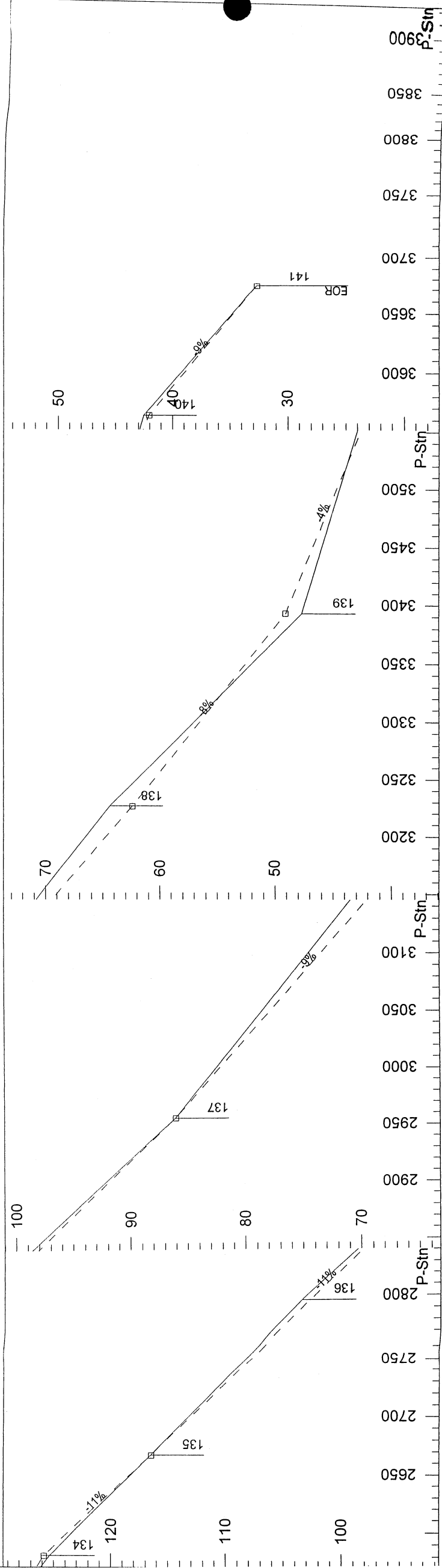
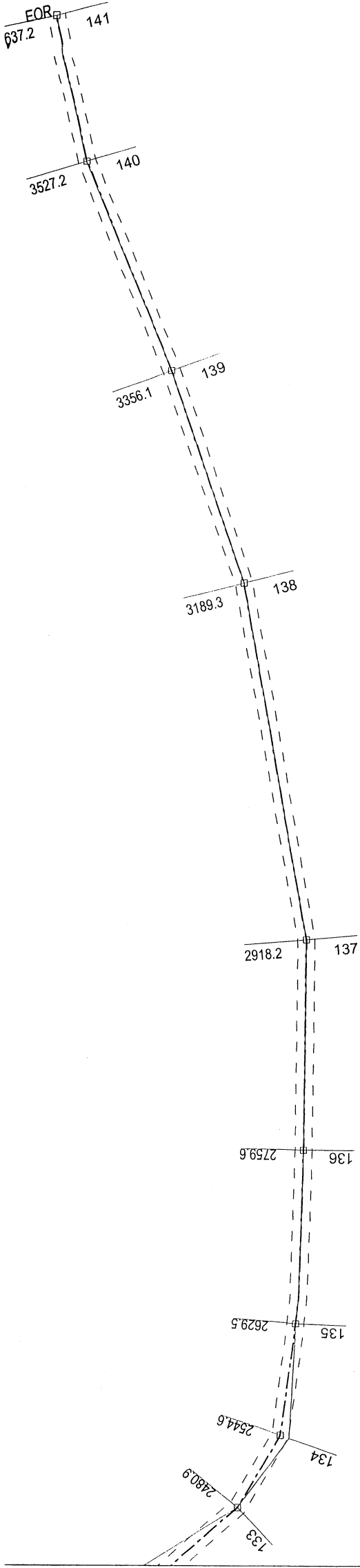
Profile Vert Scale 1:120

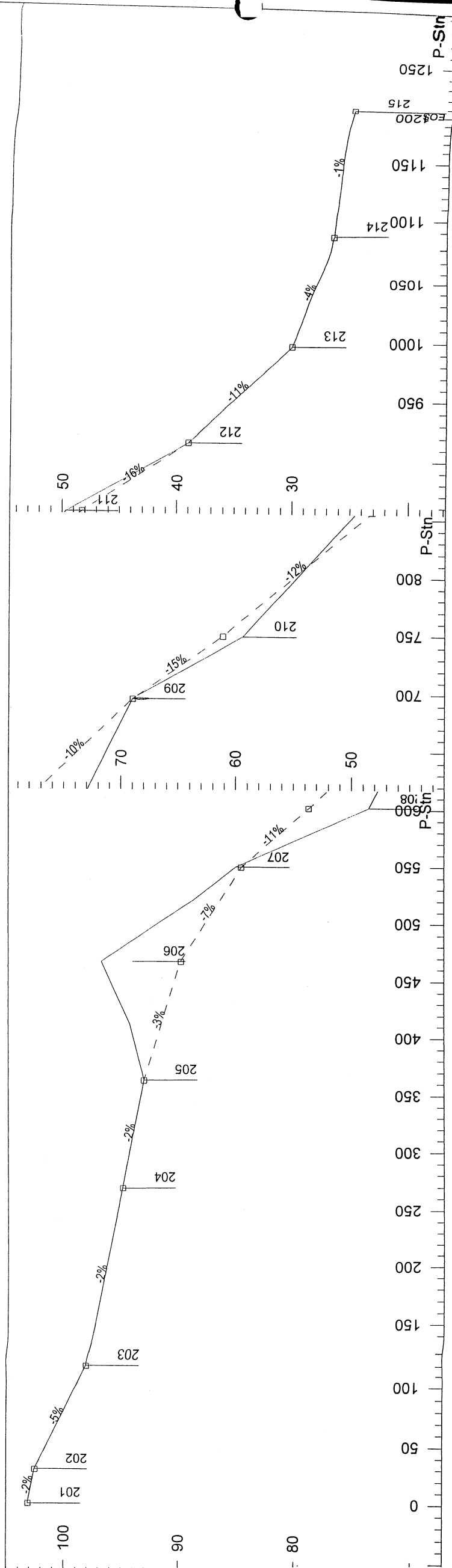
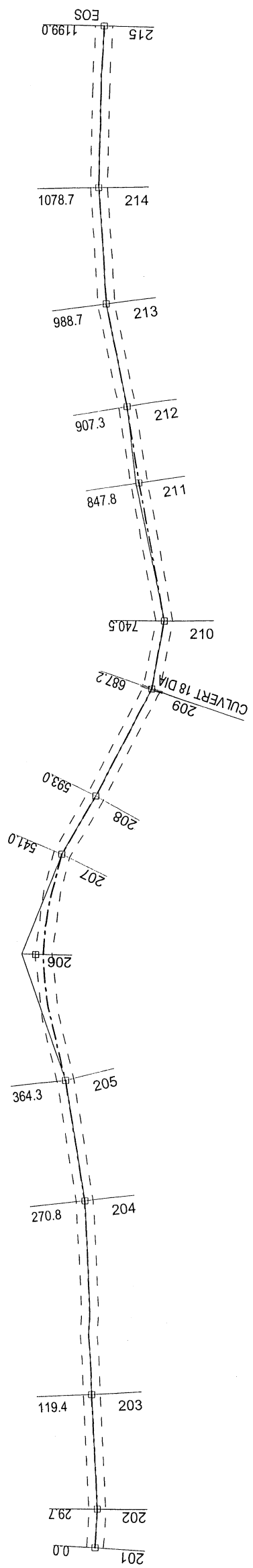
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Washington State Department of Natural Resources  
South Puget Sound Region

Betty Beaver Timber Sale  
81 RD January 29, 2004  
Contract #: 30-075787







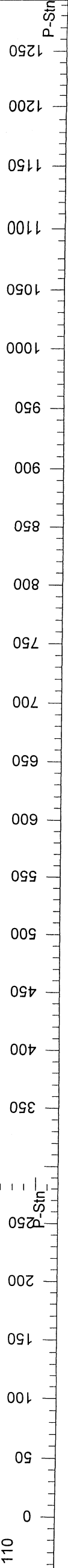
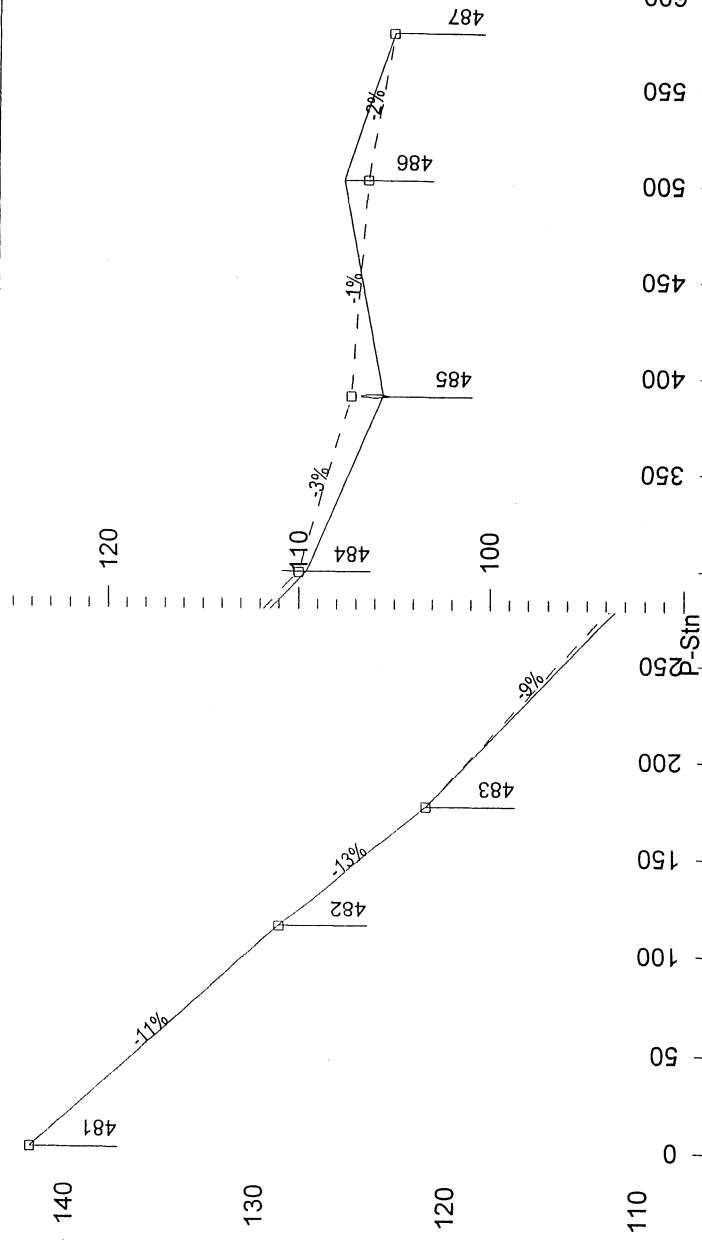
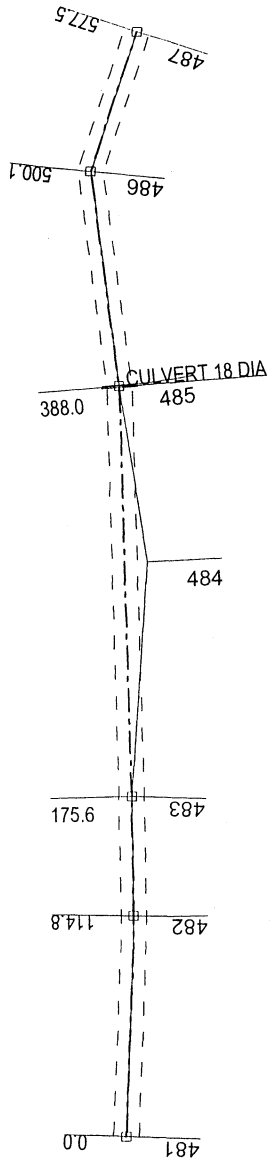
Engineer: M. Bell  
04/03/02

Plan Scale 1:1200  
Profile Vert Scale 1:120  
Profile Horz Scale 1:1200

Washington State Department of Natural Resources  
South Puget Sound Region

Betty Beaver Timber Sale  
811 RD January 29, 2004  
Contract #: 30-075787





Betty Beaver Timber Sale  
1812 RD January 29, 2004  
Contract # 30-075787

Washington State Department of Natural Resources  
South Puget Sound Region

Plan Scale 1:1200  
Profile Vert Scale 1:120  
Profile Horz Scale 1:1200

Engineer: M. Bell  
04/03/02

Page 1 of 1

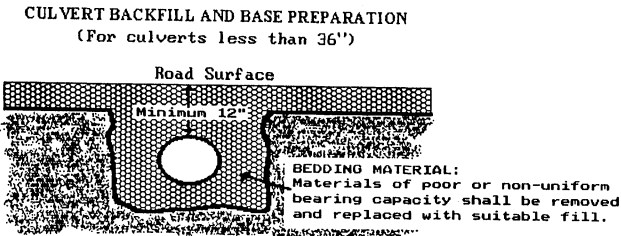
CULVERT LIST

Road Number	Location	Culvert		Length (ft)			Riprap (C.Y.)			Backfill Material	Placement Method	Const. Staked	Remarks
		Dia.	Type	Culvert	Downspt	Flume	Inlet	Outlet	Type				
81	11+15	18"	PD	30			0.2	0.2	QS or SR				Place across 8 Rd in line with 81 Connector's ditchline.
81 Connector	0+60	18"	PD	36			0.2	0.2	QS or SR				
811	6+87	18"	PD	30			0.2	0.2	QS or SR				
812	3+88	18"	PD	30			0.2	0.2	QS or SR				

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S  
GS16 = Galvanized Steel AASHTO No. M36, 16 Gauge  
AS12 = Aluminized Steel AASHTO No. M274, 12 Gauge  
TEMP = Temporary Culvert

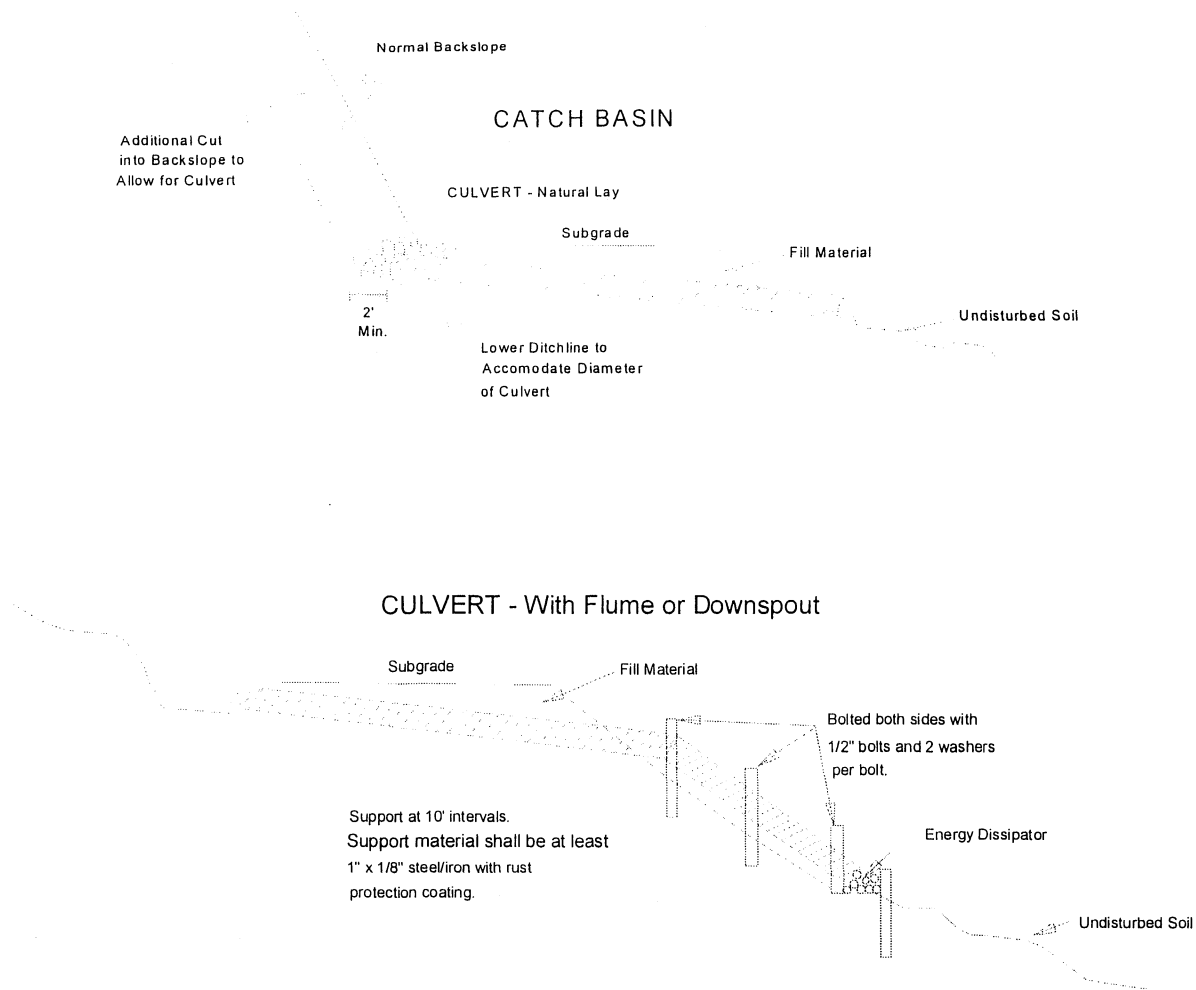
Key:

- QS - Quarry Spalls
- SR - Shot Rock
- NT - Native (bank run)
- SL - Select Fill
- HL - Heavy Loose Riprap
- LL - Light Loose Riprap
- Flume - Half round pipe
- Downspout - Full round pipe

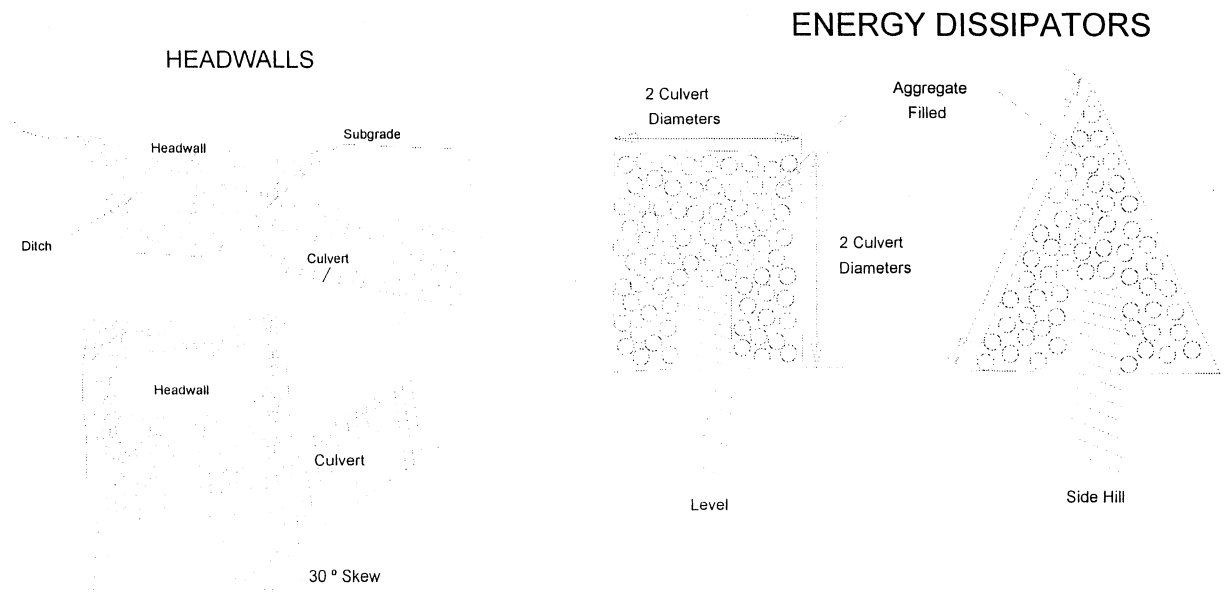


CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)



Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:  
Depth: 1 culvert diameter  
Aggregate: as specified in the CULVERT LIST.

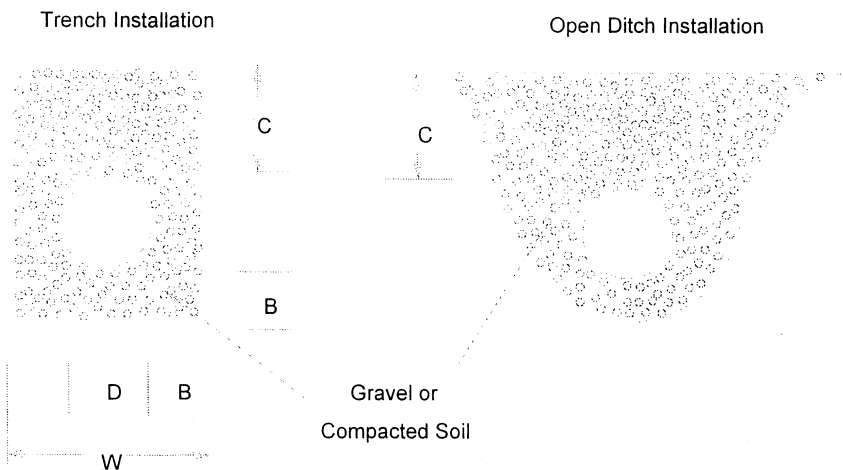
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

- 1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.
- 2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.
- 3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.
- 4. Site conditions and availability of bedding materials often dictate the type of installation method used.
- 5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS  
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON  
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD  
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills

1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½ : 1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface

1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
3. Watering may be required to control dust and to retain fine surface rock.
4. Desirable surface material shall not be bladed off the roadway.
5. Replace surface material lost or worn away.
6. Remove berms except as directed by the State.
7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage

1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
5. Keep silt bearing surface runoff from getting into live streams.

D. Structures

Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season

Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

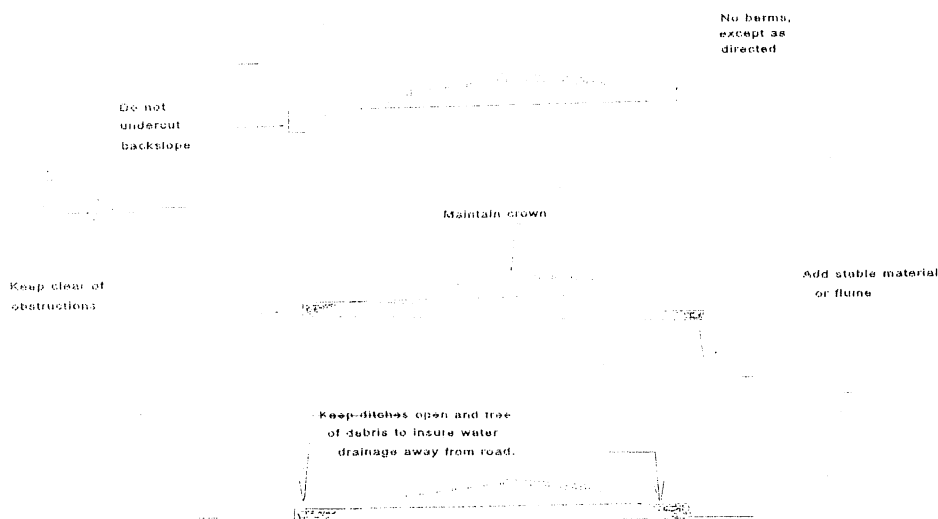
F. Debris

Remove fallen timber, limbs, and stumps from the slopes or roadway.

2. Existing Roads – Timber Sale, Operator Maintained

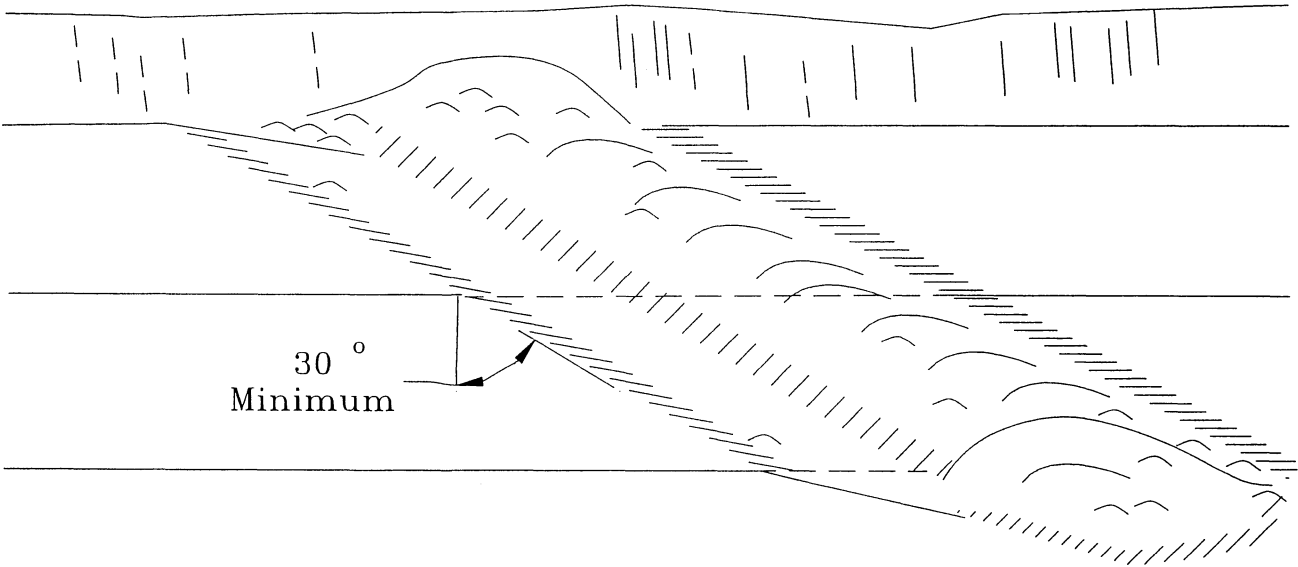
- A. Same as above but not to exceed the condition of the road on the date the contract was signed.

3. A.R.R.F. – Directed maintenance to comply with these specifications.

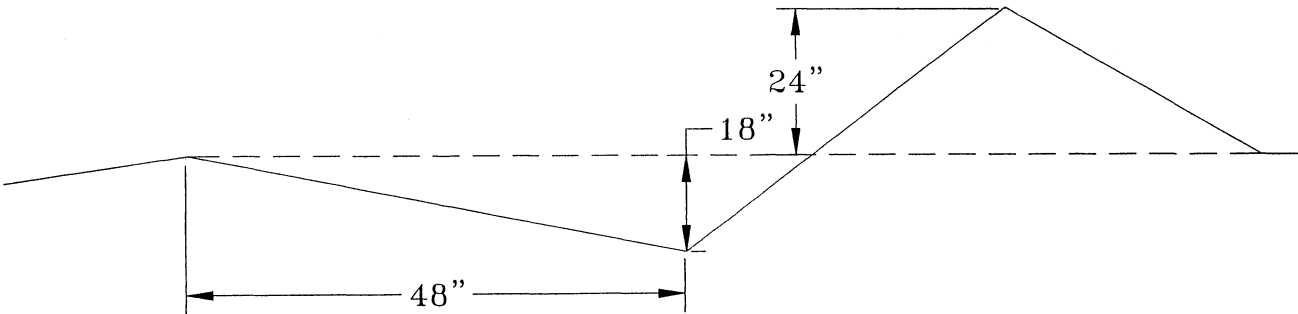


# Non-Drivable Water Bar Detail

## Cross Ditch



## Cross Section at Centerline



Betty Beaver Timber Sale  
Non-Drivable Water Bar Detail

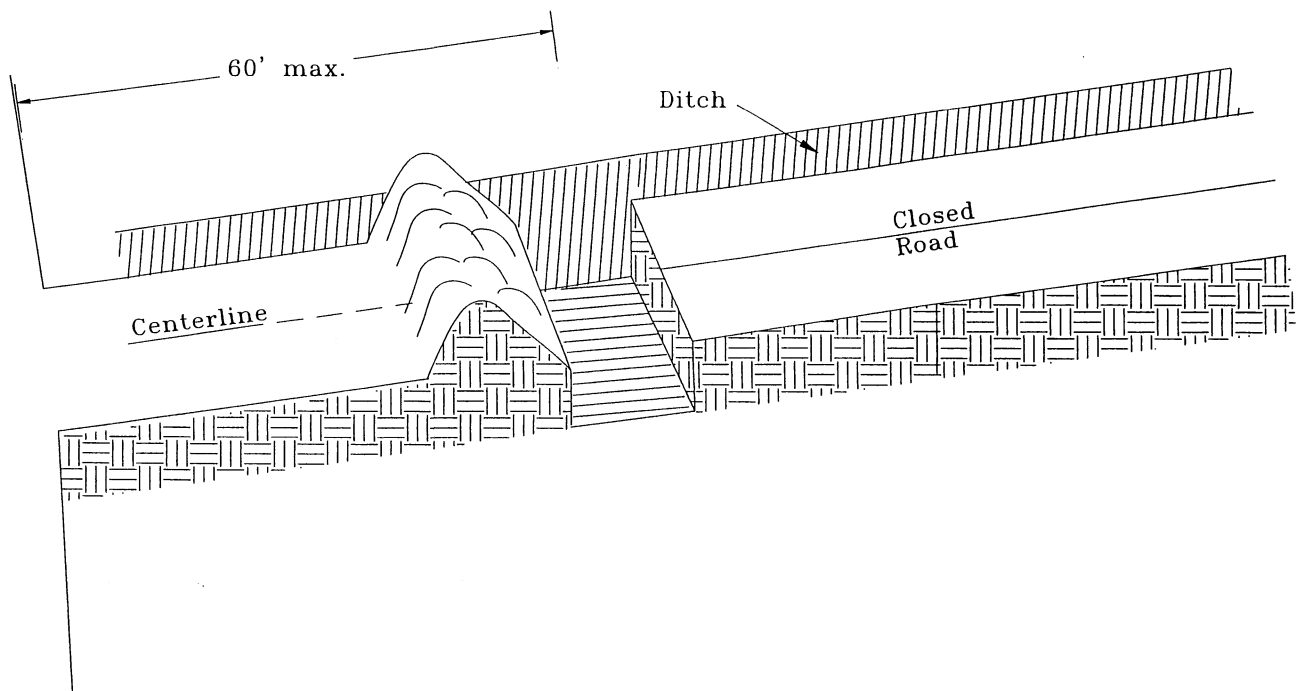


WASHINGTON STATE DEPARTMENT OF  
Natural Resources

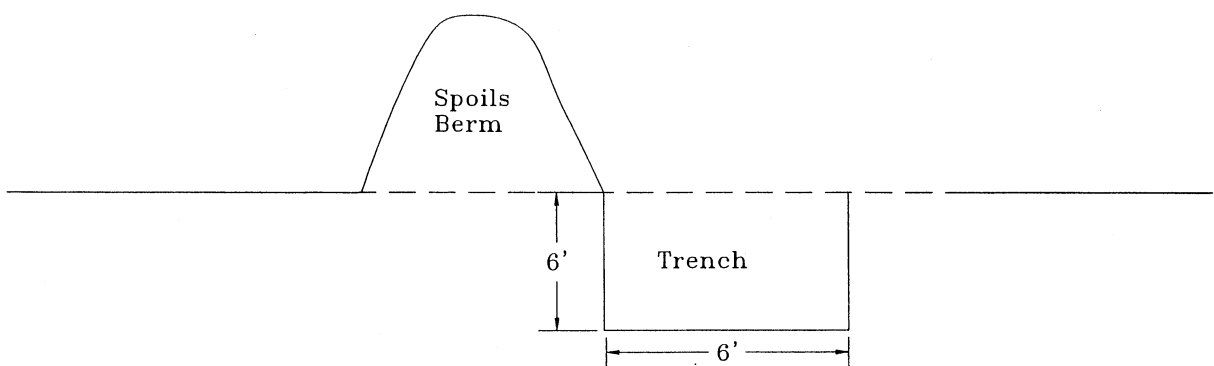
SPS Region

Scale : None  
Drawn by: M.A.D.

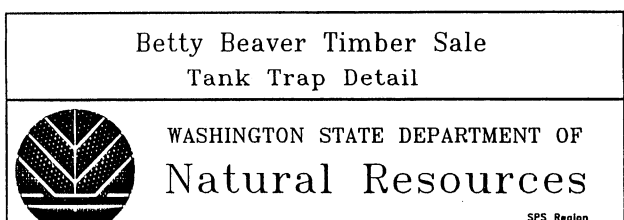
# Single Tank Trap Detail



## Cross Section at Centerline



Scale : None  
Drawn by: M.A.D.



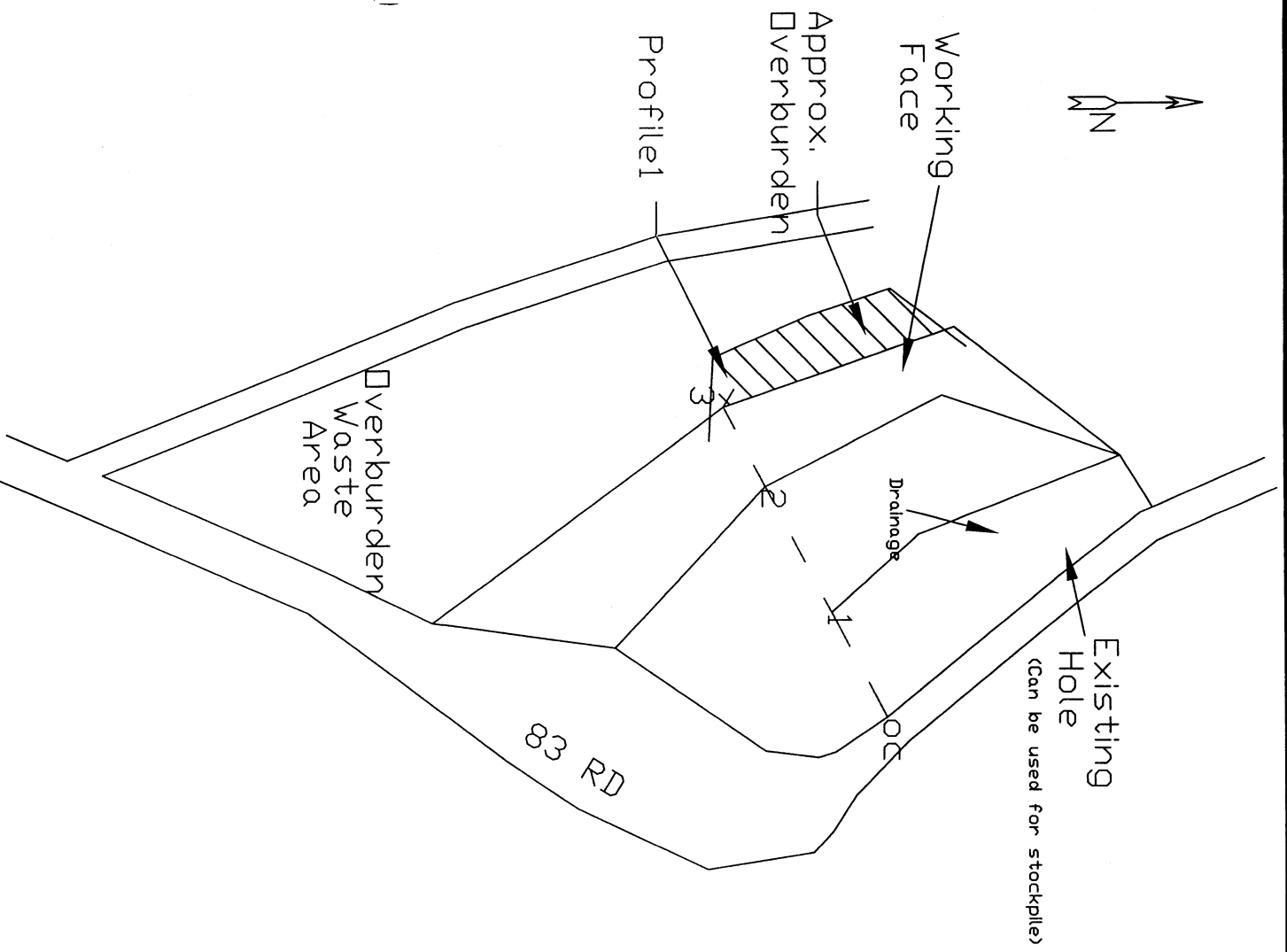
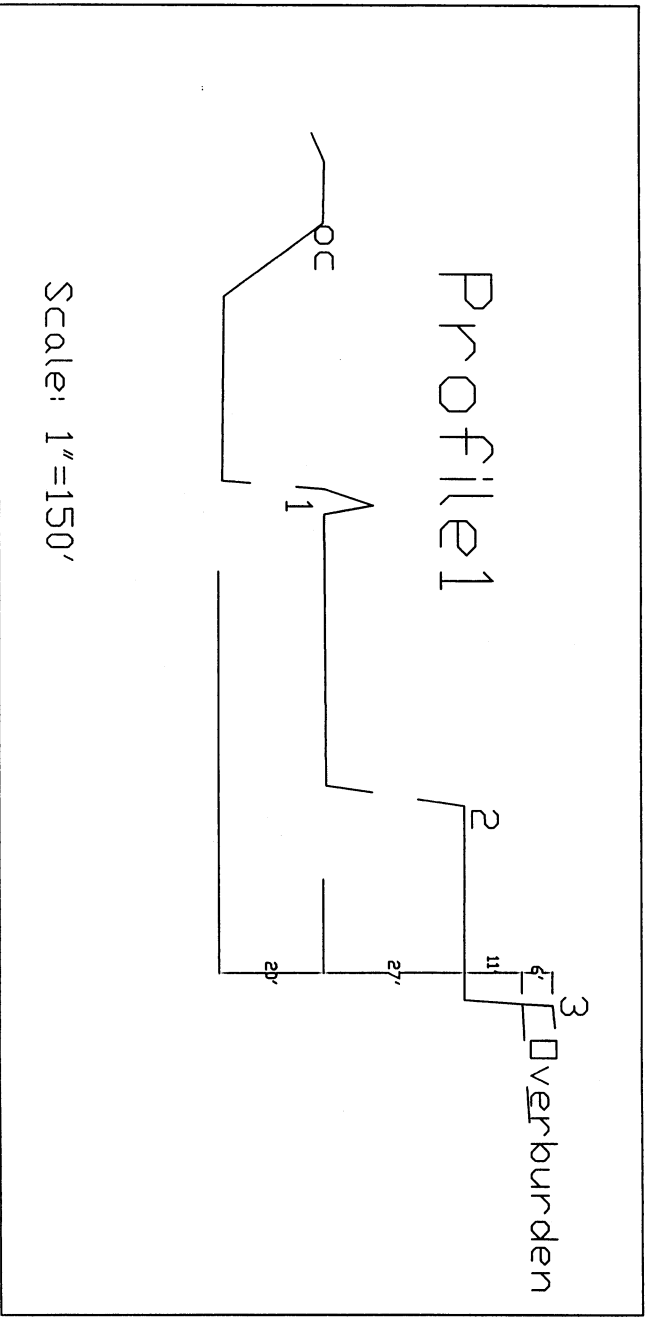
Legal Description: SE ¼ NW ¼ Section 35 Township 16 North Range 5 East

Rock Pit Name: Charcoal Pit

#### PIT DEVELOPMENT PLAN

1. Overburden as shown on the attached plan view must be moved at the start of pit operation to overburden waste area.
2. Pile debris as directed by the Contract Administrator.
3. A minimum stripping width of 20 feet must be maintained from all pit faces and at the termination of operations pit shall be left in said condition.
4. Pile all reject rock and overburden away from pit working area as shown and separate from debris.
5. Pit floor shall be sloped to allow drainage into either the existing hole or across the 83 road.
6. Maximum face height will be no greater than 20 feet.
7. Minimum bench width will be no less than 20 feet.
8. At the termination of use the pit face shall have a maximum backslope of 1/4:1.
9. Quantity and quality of ballast pit is not guaranteed by the State.





Note: Pit condition subject to change due to multiply operators.

Date: 4/19/04  
 Scale : 1" = 75'  
 Drawn By: M.D.H.



WASHINGTON STATE DEPARTMENT OF  
 Natural Resources

Charcoal Pit Plan  
 Betty Beaver Timber Sale